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Pest Management

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OFFICIAL NEWSLETTER OF THE INTEGRATED PEST MANAGEMENT RESEARCH, DEVELOPMENT AND APPLICATIONS PROGRAM
2500 SHREVEPORT HIGHWAY · PINEVILLE, LOUISIANA 71360

Decision Key On-Line in Florida

The June 1983 issue of the School of Forest Resources and Conservation (University of Florida) Extension Update announced that the IPM-DK (Integrated Pest Management Decision Key) is now available on the FORINSY (Forest Information System). FORINSY is a computer-oriented interactive program to provide Florida landowners with forest management information. The IPM-DK provides the latest management recommendations for littleleaf disease, annosus root rot, fusiform rust, reproduction weevils, and the southern pine beetle.

The Southern Region's Pest Management group made the first computerized IPM-DK available to southern foresters on October 1, 1981 (Pest Mgt. News No. 30). In January 1983, they established a User Center in Atlanta in response to demands for use of the decision key (Pest Mgt. News No. 38). For additional information on the IPM Decision Key, contact Dan Brown, Forest Pest Management, U.S. Forest Service, 1720 Peachtree Rd., NW, Atlanta, GA 30367.

Beetle Activity on Upswing in Texas

SPB (southern pine beetle) activity has increased substantially in east Texas during 1983. Some 400 spots had been detected as of August 1. Most of the larger spots have occurred on Federal lands, particularly on the Sabine, Davy Crockett, and Sam Houston National Forests and on the Big Thicket National Preserve.

The most serious losses are on the Four Notch unit of the Sam Houston National Forest. This unit is a Rare II further planning area, set aside for potential wilderness designation. In the absence of control, the

number and size of spots have increased dramatically. One spot expanded in size from 10 acres in April to over 1,000 acres by August. It is interesting to note that the Four Notch area falls within one of 23 grid blocks (18,000-acre units) identified this past winter as high hazard for SPB by Texas Forest Service entomologists. Control efforts (salvage and cut-and-leave) have recently been initiated to prevent further spread of infestations to adjacent National Forest and private lands. The phenomenal increase of spot size on the Four Notch emphasizes the destructive potential of the SPB under optimal host and environmental conditions.

Control of spots elsewhere in the State is progressing satisfactorily. Few beetle spots have been reported on private or industrial lands in the Polk and Tyler Counties SPB demonstration project area. The Texas Forest Service feels that recent efforts to identify high hazard stands and to reduce their susceptibility through thinning or harvest have contributed to maintaining beetle activity at low levels in these counties.

Questions and Answers About the Southern Region's IPM Decision Key

- Q. What is the IPM-DK?
- A. The IPM-DK (Integrated Pest Management Decision Key) is an interactive, user-friendly, computer program that lists pest management options for several insect and disease problems. The program considers a variety of factors such as the environment, economics, geographic location, pest interaction, and other variables in listing suggestions for an almost unlimited number of scenarios.
- Q. Why do I need the IPM-DK?
- A. The IPM-DK provides an up-to-date list of management options tailored to your individual stand. This eliminates the need to search through a

number of publications and then try to figure out how the information applies to your individual stand.

Q. Do I have to have a computer to use the IPM-DK?

A. No. It helps to have a terminal and telephone modem which communicates with the host computer, but one can also use the IPM-DK User Center, which requires no terminal.

Q. How does the User Center work?

A. In one of three ways:

1) By submitting a filled in form and receiving a list of management options via return mail.

2) By answering questions on the telephone and receiving verbal and/or written recommendations.

3) By communicating directly with the computer via telephone hookup.

Q. Is there a fee to use the IPM-DK?

A. No. The only cost is the cost of the phone call.

Q. How do I contact the User Center to interact with the computer via a terminal?

A. First, set your terminal for 300 BAUD at full duplex. Next, call (404) 221-5200 or (FTS) 242-5200 and make contact. The program is then self-explanatory and totally user-friendly.

Q. If I don't have a terminal, how do I use the IPM-DK User Center?

A. First, obtain a form from: IPM-DK User Center Director, USDA Forest Service (FPM), 1720 Peachtree Rd., NW, Atlanta, GA 30367, (404) 881-2961

Next, either submit the form to this address or call in the information via telephone. You will receive recommendations via telephone or return mail, as you wish.

Q. When can I use the IPM-DK?

A. Completed forms can be sent at any time and will be processed the same day they are received. The computer can be contacted from 8:00-5:00, Monday through Friday. By calling (404) 221-4796 ahead of time, you can arrange to have the computer left on at different hours.

Q. What if I want more information on a particular recommendation?

A. The program has the option of expounding on a recommendation at the request of the user. It is a simple process, and the introduction of the program explains how to do it. For those without a terminal, a complete expansion of all possible recommendations is provided with the recommendations listed for the particular situation being analyzed.

Q. What pests are considered in the IPM-DK?

A. The computer "determines" which pests will be considered by information provided by the user. For example, if the situation is a 40-year-old loblolly pine plantation in southern Arkansas, southern pine beetle, fusiform rust, annosus root rot, and pales weevil are automatically considered.

Q. How many kinds of situations are there?

A. Several. There are "sub-keys" for hardwood pests and pine pests. Future additions will include seed orchard pests, nurseries, urban trees, etc.

Q. What if I disagree with some part of the program or what if I have a suggestion?

A. We welcome your criticism and suggestions. Simply call or write the IPM-DK Coordinator with your input.

SPB Economic Analysis to be Conducted

Economists, pest management specialists, and foresters from several Forest Service, university, and State forestry organizations met in Raleigh, NC, on July 20, 1983, to develop a strategy for a southern pine beetle economic analysis. More specifically, the analysis is to address expenditures for southern pine beetle-related activities within the Forest Pest Management unit of State and Private Forestry. The general objective is to establish a measure of net returns accruing to the public from Federal funds expended on suppressing the SPB and, to the extent possible, determine the optimal level of expenditure which would develop greatest gains with minimal funds. It is also anticipated that such an analysis might offer further insight into optimizing distribution of funds among the various tasks and activities within SPB suppression projects.

Major responsibility of the analytical effort will be with the Southeastern Center for Forest Economics Research, headquartered at Research Triangle Park, NC. The Center includes economists from the Southeastern Forest Experiment Station and North Carolina State and Duke Universities. Drs. George Dutrow and Ed deSteiguer of the Southeastern Forest Experiment Station will serve as project leader and principal investigator, respectively. They will work through a team of economists and biologists from several organizations throughout the South. The team will draw heavily upon ESPBRAP and IPM Program data sets, and descriptive, predictive, and simulation models to provide a final evaluation report by April 1984.

Technology Transfer Highlights

IPM Program Technology Transfer

Investigator(s)	Performing organization(s)	New technology	Technology being directed to
<i>IMPACTS</i>			
S. A. Alexander	VPI&SU	Technique to quantify annosus infection level in a stand and its impact on tree growth	Alabama Forestry Commission Virginia Division of Forestry S&PF (FPM) Belanger and Connor projects Silvicultural practices and hazard rating TT team
R. M. Feldman P. J. H. Sharpe Hsin-i-Wu	Texas A&M Univ.	Validated SPB spot growth model	Texas Forest Service Georgia Forestry Commission S&PF (FPM)
R. L. Hedden*	Clemson Univ.	Validated spot growth model; technique to project outbreaks based on early season measurements	Texas Forest Service Georgia Forestry Commission S&PF (FPM) Hain and Michaels projects
P. J. Michaels	Univ. Va.	Technique to project SPB trends in climatic districts based on climatic events	Va. Division of Forestry N.C. Forest Service Hedden and Hain projects
W. L. Nance T. R. Dell R. C. Froelich E. Shoulders	South. For. Exp. Stn.	Procedure for estimating losses to fusiform rust in loblolly and slash pine plantations through a rotation	S&PF (FPM) Pest Mgt. Specialists Forest Industry
W. A. Nettleton M. D. Connor	S&PF (FPM)	Use of spot growth models in biological evaluations	Pest Mgt. Specialists
F. M. Stephen* H. A. Taha	Univ. Ark.	SPB spot growth model and volume/value loss	Alabama Forestry Commission Texas Forest Serv. S&PF (FPM)
J. D. Ward* M. C. Remion C. W. Dull	S&PF (FPM) SC State Comm. Forestry S&PF (FPM)	Procedure for measuring bark beetle caused timber mortality over large areas of mixed ownership in place over time	Pest Mgt. Specialists
<i>UTILIZATION</i>			
G. A. Koenigshof J. R. Beckwith III J. T. Rice	SE Forest Exp. Stn. Univ. Ga.	Validated appearance classes	S&PF (WU) Procurement foresters State utilization specialists Extension utilization specialists Guidelines for utilizing SPB-killed timber TT team
		Suitability of beetle-killed wood as core for COM-PLY	Georgia Pacific Corp. Guidelines for utilizing SPB-killed timber TT team Plywood industry
J. G. Massey* W. K. Murphey D. W. Patterson	Texas A&M Univ.	Validated appearance classes	S&PF (WU) Procurement foresters State utilization specialists Extension utilization specialists Guidelines for utilizing SPB-killed timber TT team
		Modified sawmill decision model (SAMTAM)	Texas Forest Service Coulson's project (Decision support)

Investigator(s)	Performing organization(s)	New technology	Technology being directed to
			State utilization specialists Extension utilization specialists Guidelines for utilizing SPB-killed timber TT team Sawmill industry
<i>POPULATION CHANGE</i>			
C. W. Berisford L. H. Kudon	Univ. Ga.	Host selection behavior of parasites on SPB in presence of <i>Ips</i>	Stephen's project South. For. Exp. Stn.-RWU 2203 Researchers involved in biological control
C. W. Berisford R. F. Mizell L. H. Kudon	Univ. Ga.	Method for determining <i>Ips</i> numbers based on age and size of residue left after cutting	Belanger and Nebeker projects
R. N. Coulson P. E. Pulley T. L. Wagner	Texas A&M Univ.	Sampling options for <i>Ips</i> spp. and BTB Distribution & abundance of <i>Ips</i> spp. <i>Ips</i> spp. interactions w/SPB Developmental rates for SPB and <i>Ips</i> spp.	Other bark beetle researchers Feldman and Foltz projects Stephen project Foltz and Hain projects
J. L. Foltz R. C. Wilkinson	Univ. Fla.	Sampling technique for <i>Ips</i> spp. in slash pine Description of <i>Ips</i> spp. interactions	Other bark beetle researchers Coulson, Feldman, Hain, Nebeker and Stephen projects Feldman project
F. P. Hain	NC State Univ.	SPB/ <i>Ips</i> interactions at low levels of SPB Numbers of beetles needed to successfully attack trees in various vigor states Detection/evaluation/prediction model for endemic vs. epidemic SPB populations	Coulson, Feldman, Hain, and Stephen projects Coulson, Nebeker and Stephen projects NC Forest Service Georgia Forestry Commission Coulson, Hedden, Michaels and Stephen projects
<i>HOST SUSCEPTIBILITY AND HAZARD RATING</i>			
R. P. Belanger* R. L. Hedden	SE Forest Exp. Sta. Clemson University	Hazard rating system for plantations	Forest industry S&PF (FPM) Silvicultural practices and hazard rating TT team
J. R. Bridges	South. Forest Exp. Stn.	Relationship between beetle micangial fungi and SPB attack and reproductive behavior	Coulson, Hain, Nebeker, and Stephen projects Insect/host interactions working group
R. N. Coulson P. E. Pulley T. L. Wagner	Texas A&M Univ.	Bark beetle/host interactions in simulated lightning-struck trees	Bridges, Feldman, Hain, Nebeker and Stephen projects Insect/host interactions working group
R. M. Feldman P. J. H. Sharpe Hsin-i-Wu	Texas A&M Univ.	Host susceptibility conceptual model	Coulson, Hain, Nebeker, and Stephen projects Insect/host interactions working group
F. P. Hain T. O. Perry	NC State Univ.	Understanding of host susceptibility/resistance	Coulson, Hain, Nebeker, and Stephen projects Insect/host interactions working group
J. D. Hodges T. E. Nebeker	Miss. State Univ.	Summary of effects of different thinning practices on subsequent pest problems	Timber mgmt. researcher Forest engineering/harvesting equipment researchers Foresters

Investigator(s)	Participating Institutions	New Technology	Technology being directed to
		Role of toxins produced by the blue-stain fungus	Silvicultural practices and stand hazard rating TT team
P. L. Lorio, Jr. R. A. Sommers	South. Forest Exp. Stn.	Relationship between soils and SPB infestation occurrence/stand hazard rating	Kisatchie Nat'l. Forest S&PF (CF) Silvicultural practices and stand hazard rating TT team
T. E. Nebeker J. D. Hodges	Miss. State Univ.	Thinning guidelines to reduce stand and soil damage which predisposes trees to attack by pests	Weyerhaeuser Company Southern forestry community Silvicultural practices and stand hazard rating TT team S&PF (CF)
F. M. Stephen T. D. Paine H. A. Taha	Univ. Ark.	Understanding of host/insect interactions (susceptibility to attack, suitability for brood development)	Coulson, Feldman, Hain, and Nebeker projects Insect/host interactions working group
<i>CONTROL</i>			
R. P. Belanger T. Miller R. S. Webb J. F. Godbee	SE For. Exp. Stn. SE For. Exp. Stn. Univ. Fla. Union Camp	Silvicultural guidelines to reduce losses from pests in plantations	Union Camp Corp. Silvicultural practices and stand hazard rating TT team
C. W. Berisford	Univ. Ga.	Technique to stop SPB spot growth with attractant frontalure	Ouachita National Forest Georgia Forestry Commission Kimberly Clark Corp. S&PF (FPM)
C. W. Fatzinger I. L. Williams	SE Forest Exp. Stn.	Trapping technique for detecting and monitoring <i>Ips</i> spp. and BTB attacks on naval stores and other high value stands	Turpentine Growers Assn. S&PF (FPM)
C. K. Franklin* A. S. Jones F. L. Hastings	SE For. Exp. Stn.	Dursban and Sumithion registered for <i>Ips</i> spp. preventive and remedial control	S&PF (FPM) Southern forestry community
J. D. Hodges T. E. Nebeker	Miss. State Univ.	Summary of effects of different thinning practices on subsequent pest problems	S&PF (CF) Forest industry Silvicultural practices and stand hazard rating TT team
T. E. Nebeker J. D. Hodges	Miss. State Univ.	Thinning guidelines to maintain vigor and reduce associated pest damage	S&PF (CF) Weyerhaeuser Company Silvicultural practices and stand hazard rating TT team
J. C. Nord A. S. Jones F. L. Hastings	SE Forest Exp. Stn.	Insecticides registered for BTB preventive control Pine oil for SPB prevention	S&PF (FPM) Southern forestry community
T. L. Payne	Texas A&M Univ.	Technique to stop SPB spot growth with attractant frontalure	Texas Forest Service Big Thicket Natl. Preserve Kimberly Clark Corp. S&PF (FPM)

Investigator(s)	Participating Institutions	New technology	Technology being directed to
<i>INTEGRATED PEST MANAGEMENT</i>			
R. F. Billings H. A. Pase III C. Walker	Texas For. Serv.	Latest technology for detecting, evaluating and managing pest problems on industrial and private lands in two-county demonstration area in Texas	Texas Forest Service IPCo Owens-Illinois Temple EasTex Champion Intl. Kirby Forest Indust. Wirt-Davis Estate St. Regis
M. D. Connor S. Weaver D. Starkey R. J. Uhler W. Nettleton	S&PF (FPM) Miss. Natl. Forests S&PF (FPM) S&PF (FPM) S&PF (FPM)	Latest technology for detecting, evaluating, and managing SPB/annosus root rot on National Forests in Mississippi	Holly Springs Ranger District
R. N. Coulson T. L. Payne L. Hu E. J. Rykiel P. E. Pulley R. F. Billings	Texas A&M Univ. Texas Forest Service	Decision support system components Interactive decision-support system for managing SPB	Texas Forest Service S&PF (FPM) Other pest mgmt. specialists Texas Forest Service
R. L. Hedden	Clemson Univ.	New SPB prevention technology for incorporation into Georgia State park management plans	Georgia Dept. Natural Resources Georgia Forestry Commission Silvicultural practices and stand hazard rating TT team
R. L. Hedden F. H. Tainter D. L. Ham	Clemson Univ. Forestry Extension	Latest technology for detecting, evaluating, and managing SPB, annosus root rot, littleleaf disease, and fusiform rust on State and private lands in S. C.	Service foresters Consultants Landowner Assistance Foresters Industrial foresters
W. Hoffard* R. L. Anderson	S&PF (FPM)	IPM slide tape	Southern forestry community
W. Hoffard S. W. Oak	S&PF (FPM)	Latest technology for detecting, evaluating, and managing SPB, annosus root rot, littleleaf disease, and fusiform rust on National Forests in S. C.	Sumter National Forest
J. R. Hyland R. C. Kucera	Alabama Forestry Comm.	Annosus hazard rating technology for incorporation into forest management plans for demonstration forests in Alabama	Small nonindustrial private landowners in Alabama S&PF (FPM)
W. A. Thompson J. M. Vasievich	Duke Univ. SE Forest Exp. Stn.	Model for long term effects of SPB on growth and yield Economic model for revenue and cost trends	Silvicultural practices and stand hazard rating TT team Consultants S&PF (FPM) S&PF (CF)
<i>OTHER</i>			
D. L. Kulhavy*	Stephen F. Austin State Univ.	FAMULUS file for SPB literature SPB annotated bibliography	Other bark beetle researchers Pest mgmt. specialists
J. L. Foltz* R. C. Wilkinson	Univ. Fla.	FAMULUS file for <i>Ips</i> spp. and BTB literature <i>Ips</i> spp. and BTB annotated bibliography	Other bark beetle researchers Pest mgmt. specialists

*Project completed

Program Investigator Recognized

Steve Weaver, Forester, Mississippi National Forests, was recently presented with a Certificate of Appreciation signed by Dr. Larry Lassen, Director, Southern Forest Experiment Station. Mr. Weaver has served as a co-investigator with Messrs. Connor, Starkey, and Nettleton on a project funded by the IPM Program, "Integrated Pest Management on National Forests: Demonstration Project on the Holly Springs National Forest." The certificate was given in recognition of Steve's demonstrated leadership, innovation, and cooperation in implementing pest management techniques in operational programs on the forest. The award was presented to Steve by David A. Graham, Assistant Director, Forest Pest Management Staff-Washington.

Steve is now located on the Daniel Boone National Forest in Kentucky.

SPB Control Information for Southern Consultants

The April 1983 issue of *The Consultant* contained an article on controlling southern pine beetle. The article was prepared by the IPM Program Management team late last year so it could be published

prior to the 1983 beetle season. The information was presented to aid consultants whose clients wish to prevent or reduce southern pine beetle-caused losses. The citation follows: Hertel, G. D.; Thatcher, R. C.; Mason, G. N. Controlling the southern pine beetle. *The Consultant* 28:38-41. 1983.

Copies of the article can be obtained by writing to: Program Manager, IPM Program, 2500 Shreveport Highway, Pineville, LA 71360.

Other Publications

Hertel, G.D; Thatcher, R.C.; Mason, G.N. Controlling the southern pine beetle. *The Consultant*. 28 (2):38-41; 1983.

Linit, M.J.; Stephen, F.M. Parasite and predator composition of within-tree southern pine beetle (Coleoptera:Scolytidae) mortality. *Can. Entomol.* 115:679-688; 1983.

Nickolich, M.B. The effect of soil rotting on the growth of residual loblolly pine trees following a thinning operation. Mississippi State, MS: Mississippi State University; 1983. 54 p. Thesis.

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